DEPARTMENT OF ECOLOGY
State of Washington

Technical Support Document

SGL Composites, LLC

Rescission of PSD 14-02, Amendment 2

January 2020

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SGL Composites, LLC (SGL) Facility
Rescission PSD 14-02, Amendment 2

Air Quality Program

Washington State Department of Ecology

Olympia, Washington

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1. Executive Summary

Ecology's Eastern Regional Office issued Approval Order No. 19AQ-E062 to transfer the requirements from the Prevention of Significant Deterioration (PSD) permit and limit site emissions below major threshold for PSD – 100 tons per year (tpy) (September 5, 2019). SGL has identified that the line speed on Lines 1–6 can be run at a higher speed that previously noted nominal capacity of the lines. The increased line speed is not expected to impact any of the current SGL permit limits, and SGL is not requesting any permit limit increases. The potential to emit is the following: Nitrogen oxides (NO_X) – 223 tpy, $PM_{10}/PM_{2.5}$ – 79 tpy, and volatile organic compound (VOC) – 45 tpy based on the current feed stock and configuration without the minor permit limits. On September 9, 2019, SGL submitted a request for a rescission of PSD No. 14-02, Amendment 2 for their facility located in Moses Lake, Washington.

This Technical Support Document (TSD) provides detailed explanation for Ecology's rescission determination and to ensure all regulatory requirements have been satisfied. After further review, Ecology approves the rescission request.

2. Introduction

PSD permitting requirements in Washington State are established in Washington Administrative Code (WAC) 173-400-700 through 750 (Title 40, Code of Federal Regulations (CFR) 52.21). Washington State implements its PSD program as a State Implementation Plan (SIP)-approved program. This SIP-approved program became effective May 29, 2015. State and federal rules require PSD review of all new or modified air pollution sources that meet certain criteria in an attainment or unclassifiable area with the NAAQS. The objective of the PSD program is to prevent significant adverse environmental impact from emissions into the atmosphere by a proposed new major source, or major modification to an existing major source. The program limits degradation of air quality to that which is not considered "significant."

Under WAC 173-400-720 through 750, a project proposed at an existing major stationary source is subject to PSD review if the project either is a "major modification" to an existing "major stationary source," or is a major stationary source unto itself.

In an email September 9, 2019, SGL requested the Ecology's PSD Program to rescind PSD permit 14-02, Amendment 2 for their Moses Lake facility. Under 40 CFR 52.21 (w), Ecology may rescind a PSD permit if the applicant shows that Washington Administrative Code (WAC) 173-400-700 through 750 would not apply to the source. SGL sought to provide assurance that their Moses Lake facility will not be a "Major Stationary Source" by establishing emission caps to stay below major source threshold through Order of Approval No. 19AQ-E062 issued September 5, 2019. Ecology also reviewed and considered the facility's recent capacity changes and emission rate in making this determination.

3. The Project

3.1. The facility's location

SGL is located at 8781 Randolph Road NE, Moses Lake, Washington. The property borders Stratford Road NE to the west, Randolph Road NE to the east, and is approximately one-half mile east of the Grant County International Airport, Township 20 N Range 28 E Section 22. The bounding Universal Transverse Mercator coordinates are NAD83 Zone 11, 326705/5231086, 327498/5231054, 327488/5230395, 326697/5230457.

The site is within a Class II area that is in attainment or unclassified with regard to all pollutants regulated by the National Ambient Air Quality Standard (NAAQS) and state air quality standards.

3.2. Source classification

In an email to SGL dated September 10, 2018, Ecology made the following determination:

"You identified two major issues: Is SGL one of the 28 listed sources and potential increase in PM emissions. First in response to Ashley Jones's August 13, 2018, email regarding SGL's SIC and PSD threshold applicability. After reviewing your submittal, Ecology believes the SGL Moses Lake facility is a chemical plant due to the following reasons. I have attached your submittal and some other guidance documents above.

SIC (1977)

The attached documents provide information that does not support changing the SIC. Ecology still finds the EPA letter declaring SGL to be a 100 ton per year (tpy) source to be the correct definitive. I tried to contact the Sacramento air regulatory staff that responded to Eric Hansen's email, but he has retired.

The 28 list sources was based on the list of SIC codes at the time (prior 1980).

Ecology believes that the facility is a chemical plant because:

April 13, 2015 Technical Support Document for PSD permit:

1) On March 23, 2010, SGL applied to install and operate two **polyacrylonitrile (PAN)** carbon fiber production lines. Each line had the capacity to produce up to 1,500 tons of carbon fiber per year. In order to stay below 100 tons per year (tpy) limit, SGL requested and received a federally enforceable limit of 99 tpy on nitrogen oxides (NOX). Permit Number 10AQ-E362 was issued on July 13, 2010.

2) On August 15, 2014, SGL applied to increase the size of the facility to 10 lines. Each of the additional lines is expected to produce 1,760 tons of carbon fiber each year and include a regenerative thermal oxidizer (RTO) and a TO to combust organic compounds

in the exhaust from the **oxidation ovens and carbonization furnaces**, respectively. An SCR will be installed on Lines 3–6 but is not proposed for Lines 7–10. Additionally, eight diesel-fueled backup emergency power generators and a fire water pump engine will be installed.

3) There are several process steps associated with producing carbon fiber. They are:

    a. Feed and Pretension: This step involves feeding carbon fibers from spools or bobbins through a series of rollers to apply uniform tension. There are no measurable emissions from the feed and pretension phase of production.

    b. Oxidation: This step involves heating the fibers in electrically powered ovens up to a temperature of 200 to 300 degrees Celsius (°C). SGL indicated that it usually takes between four and five hours to complete the oxidization phase. Each line has four electrically powered ovens with two zones each.

    c. Low-Temperature Carbonization: Each line has two electrically powered furnaces. One for low-temperature carbonization and one for high-temperature carbonization. Carbonization is the conversion of an organic substance into carbon. The fiber is fed into a furnace and heated to temperatures between 700° and 800°C in a nitrogen atmosphere. The material loses approximately 39 percent of its weight during this phase.

    d. High-Temperature Carbonization: The fiber is then fed into a second furnace and is heated to temperatures between 1200° and 1300°C in a nitrogen atmosphere. When the fiber leaves this furnace, it has a carbon content of approximately 94 percent and is 10 to 12 percent lighter.

    e. Surface Treatment: In this step, the surface of the fiber is treated by passing electricity through it. The fiber is treated as an anode in an electric cell which allows material to be bonded to the outside of the fiber. There are no measurable emissions from the sizing phase of production.

The definition of **chemical reaction** is: Interaction of two or more chemicals that produces one or more new chemical compounds, or alters the properties of the mixed chemicals. Most reactions require heat, pressure, radiation, other conditions, and/or the presence of accelerators (catalysts). **Polyacrylonitrile is converted to carbon fibers.**

The definition of a **chemical plant** is an industrial process plant that manufactures (or otherwise processes) chemicals, usually on a large scale. The general objective of a chemical plant is to create new material via the chemical or biological transformation and or separation of materials. Chemical plants use specialized equipment, units, and technology in the manufacturing process. Petrochemical plants are usually located adjacent to an oil refinery to minimize transportation costs for the feedstocks produced by the refinery. However, specialty chemical and fine chemical plants are usually much smaller and not as sensitive to location. **Example is ovens and furnaces under nitrogen atmosphere at controlled elevated temperatures.**

Based on the above review, Ecology determines that SGL for PSD applicability is a listed source – Chemical Processing Plant. If your facility existed when the regulations were established, EPA would list your facility at 100 tpy.

Particle Mater (PM) Emissions:

During our visit you indicated two potential projects that could increase PM emissions. One project was to increase production throughput which could increase PM hourly emissions. The second project would be to use a new material with a silica coating with could increase PM emissions. Scott Inloes reviewed the Technical Support Document for SGL's PSD permit and found that the $PM_{2.5}$ modeled increment and National Ambient Air Quality Standard Analysis resulted in levels near the standard. This information can be found on page 41 of the Technical Support Document. Any increase in $PM_{2.5}$ for PSD or minor permit will need to be evaluated for these standards. I suggest you work with your consultant on ways to maintain or reduce the emissions from any future project. The modeled impacts should be evaluated for any PSD or minor permitting action.

Attached is the PSD guidance document that has the PSD significate emission rate (page 9) that would trigger major permitting, https://fortress.wa.gov/ecy/publications/SummaryPages/1702014.html."

3.3. The existing facility/history

A map of the facility is shown in Figure 1 below. The building on the far left is administrative and warehouse, the building labeled Lines 1–2, Lines 3–4, and Lines 5-6 are existing structures and operational.

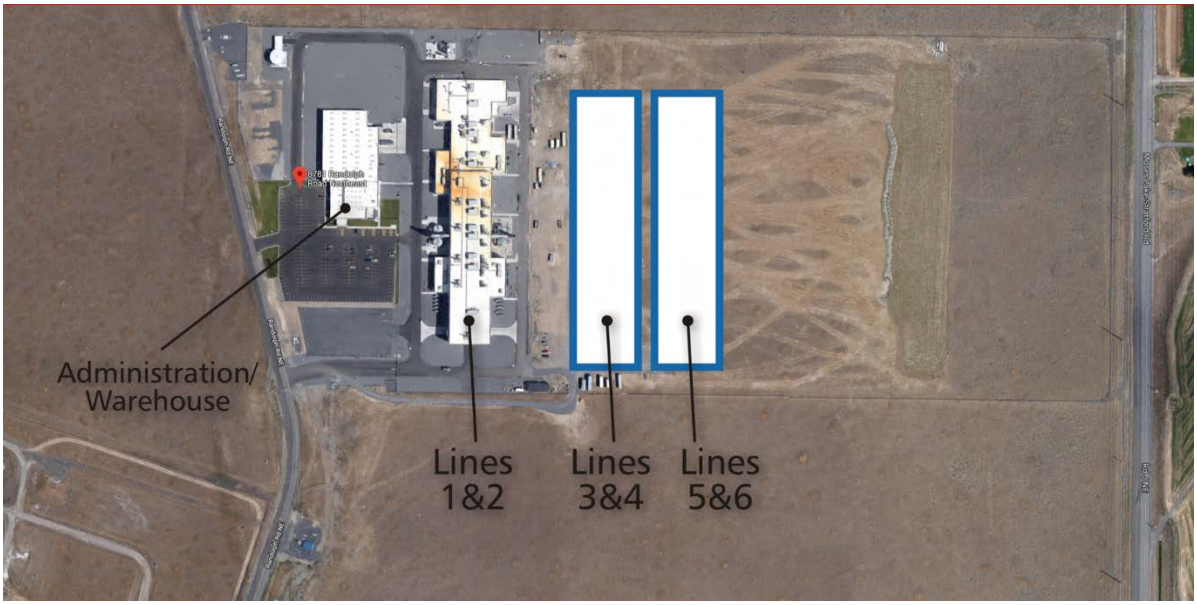

Figure 1: Map of the facility

On March 23, 2010, SGL applied to install and operate two polyacrylonitrile (PAN) carbon fiber production lines. Each line had the capacity to produce up to 1,500 tons of carbon fiber per year. In order to stay below 100 tpy limit, SGL requested and received a federally enforceable limit of 99 tpy on NO_X. Permit Number 10AQ-E362 was issued on July 13, 2010.

On March 4, 2014, SGL submitted an application to increase the size of the facility from four lines to eight lines. The proposed Lines 5–8 Project was identical to Lines 1–4 Project authorized by Permit Number 13AQ-E525 with three exceptions. SGL proposed to generate backup emergency power from diesel engines instead of natural gas engines, furnace emissions are no longer routed through an SCR control device due to plugging problems, and a new mode of operation (Standby Mode) was been requested. The furnace emissions are still routed through a TO but water injection is proposed to reduce the formation of NO_X. During the public comment period for the preliminary Order of Approval, EPA expressed its position that the approval process for Lines 5–8 should have been aggregated with the existing Approval Order. Under the terms of Settlement Agreement and Agreed Order No. 10768 signed June 16, 2014, Ecology acknowledged that Lines 1 and 2 were appropriately permitted as minor sources, and SGL agreed to submit new minor and major source permit applications addressing Lines 3–8, and the Lines 5–8 Project was never approved.

On August 15, 2014, SCLACF applied to increase the size of the facility to 10 lines. Each of the additional lines is expected to produce 1,760 tons of carbon fiber each year and include a RTO and a TO to combust organic compounds in the exhaust from the oxidation ovens and carbonization furnaces, respectively. An SCR will be installed on Lines 3–6 but is not proposed for Lines 7–10. Additionally, eight diesel-fueled backup emergency power generators and a firewater pump engine were to be installed per PSD No.14-02. Lines 7–10 were never installed. Line 6 is currently being installed.

3.4. Current proposal

Ecology's ERO issued Approval Order No. 19AQ-E062 to transfer the requirements from the PSD permit and limit site emissions below major threshold for PSD. In letters dated May 28, 2019, June 28, 2019, and email dated September 9, 2019, SGL requested the Ecology's PSD Program rescind PSD permit 14-02, Amendment 2. Order PSD 19-01 will rescind the requirements in PSD 14-02, Amendment 2.

Section H, page 10 of 19 AQ-E062 states the following (PSD pollutants only):

Aggregate emissions from Lines 1 through 6 and support equipment shall not exceed the following:

Table 1: Facility-wide Allowable Emissions

Pollutant	Emissions Limit
Nitrogen oxides (NO_X)	90 tons per 12-month rolling period
Carbon monoxide (CO)	37 tons per 12-month rolling period
Sulfur dioxide (SO_2)	19 tons per 12-month rolling period
Particulate matter (PM_{10}, $PM_{2.5}$) (filterable & condensable) including fugitives	80 tons per 12-month rolling period
Particulate matter (PM) (filterable only) including fugitives	30 tons per 12-month rolling period
Volatile organic compounds (VOC)	45 tons per 12-month rolling period

4. Emissions

4.1. Existing allowable emissions

For this determination, Lines 1-6 will be treated as current facility.

4.2. Prior PTE emissions

Table 2 prior facility's regulated pollutant emissions before Approval Order No. 19-AQ-E062 was issued.

Table 2: Prior PTE Emissions Limits

Pollutant	Proposed Emissions (tpy)
CO	46
NO_X	467
PM (filterable)	39
$PM_{10}/PM_{2.5}$	88
SO_2	25
VOC	60

Table 3 presents the facility's greenhouse gas (GHG) emissions.

Table 3: GHG Emissions

Pollutant	Lines 3–6	Lines 7–10	Generators	FWP	Total
CO_2e	28,858	28,858	213	8.8	57,939

6. NSR Applicability

6.1. The application

The information to rescind the PSD permit was determined to be complete on July 24, 2019. This TSD and Order of Approval are based upon the information submitted by the applicant, SGL, and its consultant, Trinity.

6.2. PSD

SGL must evaluate PSD applicability based on the emissions threshold of 100 tpy or more of a regulated pollutant rather than 250 tpy or more of a regulated pollutant. SGL is subject to PSD because:

- SGL is one of the 28-listed industries that becomes a "major stationary source" when emitting more than 100 tpy of any regulated pollutant. If any one pollutant were emitted in quantities greater than 100 tpy, the project would be subject to PSD review (Chemical Plant).

Table 4 shows which pollutants that in the past was subject to PSD review.

Table 4: Prior PSD Applicability

Pollutant	Prior PSD Annual Emissions Limits (tpy)	PSD SER (tpy)	Past Subject to PSD Review (Yes or No?)	Limits in Approval Order No. 19AQ-E003 (tpy)
NO_X	467	40	Yes	90
CO	46	100	No	37
PM	39	25	Yes	39
PM_{10}	88	15	Yes	80
$PM_{2.5}$	88	10	Yes	80
VOC	60	40	Yes	45
SO_2	25	40	No	19
GHGs	57,939	75,000	No	---

6.3. Future modifications that could trigger PSD – 40 CFR 52.21 r4

If, in the future, SGL requests to increase the site-wide emissions greater than the major threshold of 100 tpy of non-GHG emissions (including fugitive emissions), PSD permitting would be required prior to construction or change in operations to cover site-wide major emissions (40 CFR 52.21(r)(4)).

7. Conclusion

On September 5, 2019, ERO issued Approval Order No. 19AQ-E062 to limit site emissions below major threshold for PSD. In a letter dated May 28, 2019, SGL sent a letter to Ecology's PSD programs to rescind PSD Permit 14-02, Amendment 2 for the facility based on Approval Order No. 19AQ-E062 limiting emissions below major threshold for PSD.

In relation to the above equipment and the evaluation outlined in the Technical Support Document associated with PSD 14-02, Amendment 2, the Washington Department of Ecology, pursuant to RCW 70.94.152, WAC 173-400-560, 40 CFR 52.21(w) makes the following determination, after the 30-day public comment period closed on December 31, 2019:

- The SGL manufacturing Moses Lake facility now operates under Approval Order No. 19AQ-E062 that contains the limits and monitoring prior contained in PSD permit 14-02, Amendment 2, and additional requirements, which will limit emissions below major thresholds for PSD. Regulatory Order PSD 19-01 rescinds PSD 14-02.

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